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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/592,949	09/15/2006	Takashi Arakane	296367US0PCT	8692
22850	7590	02/22/2010		
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER YANG, JAY	
			ART UNIT 1794	PAPER NUMBER
			NOTIFICATION DATE 02/22/2010	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/592,949	<b>Applicant(s)</b> ARAKANE ET AL.	
	<b>Examiner</b> J. L. YANG	<b>Art Unit</b> 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 November 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/31/06; 12/03/07; 01/14/08; 06/23/08</u> .                  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. This Office Action is in response to the Applicant's Amendments/Arguments and Remarks filed on 11/23/09.

#### ***Response to Amendments***

1. The rejection of Claims 1, 2, and 5 under 35 U.S.C. 102(b) as being anticipated by Shi et al. (US 5,554,450 A) in the Office Action filed 07/23/09 is overcome by amendment to the independent Claim 1.

2. The rejection of Claims 4 and 6 under 35 U.S.C. 103(a) as being unpatentable over Shi et al. (US 5,554,450 A) in view of Hoag et al. (US 2003/0201415 A1) in the Office Action filed 07/23/09 is overcome by amendment to the independent Claim 1.

3. The rejection of Claim 7 under 35 U.S.C. 103(a) as being unpatentable over Shi et al. (US 5,554,450 A) in view of Nakamura et al. (US 6,509,109 B1) in the Office Action filed 07/23/09 is overcome by amendment to the independent Claim 1.

#### ***Response to Arguments/Remarks***

1. Regarding the rejection of Claims 1 and 3 under 35 U.S.C. 103(a) as being unpatentable over Oshiyama et al. (US 2004/0115476 A1), the Applicant states on page

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8 that the Examiner has made an error in assigning  $X_1$  = formula (b), and further states that  $X_1 = X_a$  which is erroneously stated in the Specification and defined in [0034]. The examiner disagrees. Oshiyama et al. clearly states that  $X_1$  = formula (b) (end of [0033]) and that  $X_a$  is the variable found in formula (g) and is thus not meant to be  $X_1$ .

The Applicant states on page 8 that in order to arrive at a compound as claimed, one would have to pick and choose from a huge number of possible alternatives. The Examiner respectfully disagrees since Oshiyama et al. discloses a limited number of variables for  $X_1$  (formulas (a)-(k), [0033]) that can comprised of a phenyl base ring with a limited number of substituent positions, with the fact that phenyl groups are widely known aromatic groups known in the art and thus can be rendered obvious in their use as substituents.

The Applicant states on pages 9 that it would not have been obvious from Oshiyama et al. to position the Ar group of Formula (1) para to the  $R_1$  substituent represented by formulas (2) or (3) given that such a para arrangement results in an improved organic EL device over a compound with a meta arrangement (such as the compound (H-4) on page 9 of the Arguments/Remarks). However, clear obviousness arises from the fact that if  $X_1$  formula (b) in the general formula as disclosed by Oshiyama et al. ([0031]), then there exists only four substituent positions ( $R_{21}$ - $R_{24}$ ) available for an aromatic group such that a para arrangement can be readily produced while a meta configuration would be impossible to produce.

The Applicant states on page 10 that there would be no motivation to modify the methyl groups of 1-7 to aromatic groups since the meta-substituted compound 1-2 had

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a shorter half-life. However, further motivation exists since an aromatic group can introduce desirable solubility properties beneficial to film-formation. In addition, such a modification would produce a compound that is nevertheless significantly different from that of compound 1-2, and thus should be expected to have different physical properties.

2. Applicant's arguments with respect to Claims 4, 6, and 7 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections – 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

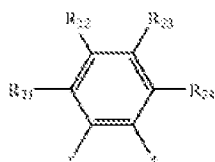
2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

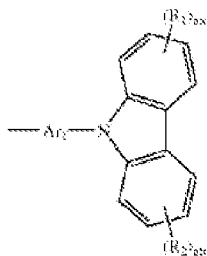
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3. Claims 1 and 3 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Oshiyama et al. (US 2004/0115476 A1) as stated in the Office Action filed 07/23/09.

Oshiyama et al. discloses material for an organic EL device represented by  $X_1$ - $(A_1)_n$  (Formula 1, [0031]) where  $X_1 =$



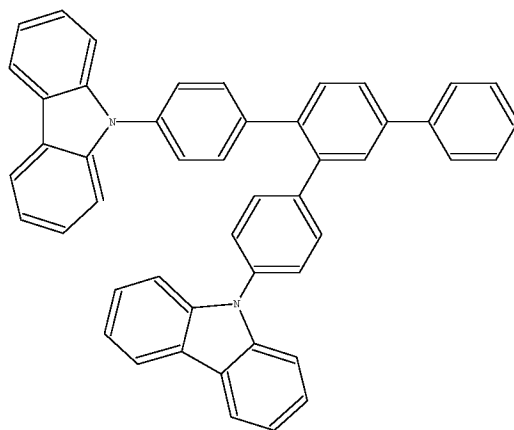
(formula (b), page 3) such that  $n = 2$  and  $A_1 =$



(Formula 2, [0032]). Oshiyama et al. discloses that Ar<sub>1</sub> in Formula 2 represents unsubstituted phenylene ([0149]) and  $R_1 = R_2 = \text{hydrogen}$  ([0033]). Oshiyama et al. further discloses that  $R_{21}$ - $R_{24}$  = independently represent a hydrogen atom or an unsubstituted aryl group, provided that  $R_{21}$ - $R_{24}$  are not all hydrogen atoms ([0034]). It would be obvious to one of ordinary skill in the art at the time of the invention to let  $R_{21}$ ,  $R_{22}$ ,  $R_{24}$  = hydrogen and  $R_{23}$  = phenyl group such that in formula (1) of the claim,  $R_1 = R_2 =$  formula (2) with  $R_5$ - $R_7$  = hydrogen,  $R_3 = R_4$  = hydrogen, and Ar = aryl group with 6 carbon atoms with no substituent (phenyl). The motivation would be that aromatic substitutions of carbazoles and phenyl groups are known, and that Oshiyama et al.

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discloses that not all of  $R_{21}$ - $R_{24}$  can equal hydrogen such that at least one of  $R_{21}$ - $R_{24}$  should be a substituent, and such a substituent being a phenyl group ([0152]). This would result in a material for an organic EL device comprising a compound shown below:



4. Claims 2, 5, 7, and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oshiyama et al. (US 2004/0115476 A1).

Oshiyama et al. discloses the organic EL material according to Claim 1 as shown above. Oshiyama et al. discloses an organic EL device comprising an anode, a cathode, and an organic thin film (component) layer including a light-emitting layer wherein the layer contains such a material (abstract). Oshiyama et al. further discloses the use of an interfacial layer (cathode buffer layer or electron-injecting layer) comprising a lithium between the cathode and the organic thin film layer ([0222] and [0318]).

5. Claims 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oshiyama et al. (US 2004/0115476 A1) in view of Hoag et al. (US 2003/0201415 A1).

Oshiyama et al. discloses the organic EL material according to Claim 1 and the organic EL device according to Claim 5 as shown above. Oshiyama et al. discloses the use of a host + dopant combination in the light-emitting layer in which the dopant can be a phosphorescent compound ([0234]-[0242]). However, Oshiyama et al. does not disclose that the host material = compound according to Claim 1.

Hoag et al. discloses an organic EL device with an anode (103), cathode (113), and a light-emitting layer (109, Fig. 1) that contains a host material and dopant, where the dopant = phosphorescent compounds ([0118]). Hoag et al. discloses that the host material can be hole-transporting material ([0118]), including compounds such as tertiary aromatic amines ([0068], [0084]-[0115]). It would have been obvious to one of ordinary skill in the art at the time of the invention to substitute the material for an organic EL device according to Claim 1 as disclosed by Oshiyama et al. for the host material in the light-emitting layer of the organic EL device as disclosed by Hoag et al. The motivation would be that the material as disclosed by Oshiyama et al. is also an aromatic tertiary amine with hole-transporting properties (carbazoles are widely known to have hole-transporting properties) for an organic EL device, and such a substitution would provide a device with improved luminance, quantum yield, and durability ([0022]) with predictable results.

### ***Conclusion***

1. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office Action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP §



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706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to J. L. YANG whose telephone number is (571)270-1137. The examiner can normally be reached on Monday to Thursday from 8:30 am to 6:00 pm Eastern.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, D. Lawrence Tarazano can be reached on (571)272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. Lawrence Tarazano/  
Supervisory Patent Examiner, Art Unit 1794

/J. L. Y./  
Examiner, Art Unit 1794

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